UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,071	06/24/2003	Frederick G. Walther	0050.2055-001	8598

21005 7590 07/31/2006

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
LIU, LI	
ART UNIT	**PAPER NUMBER**
2613	

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/603,071	WALTHER ET AL.	
	Examiner	Art Unit	
	Li Liu	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 24 June 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-84 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-8,11,26-36,39,54-64,67 and 82-84 is/are rejected.

7)☒ Claim(s) 9,10,12-25,37,38,40-53,65,66 and 68-81 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 30 October 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

1) "101" in Figure 6. In description "101" has been mentioned for Figure 6 (e.g. page 9 line 14), however, the label is not shown in Figure 6.

2) " 103" " in Figure 14. In description " 103" " has been mentioned for Figure 14 (e.g. page 16 line 7), however, the label is not shown in Figure 14.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

1. The disclosure is objected to because of the following informalities:

1) Page 10, line 27, "handled **be**" should be changed to "handled **by**".

2) Page 13, line 19, "shown in Fig. **8**" should be changed to "shown in Fig. **9**".

3) Page 16, line 10, "212 and 213 of Fig. **12**" should be changed to "212 and 213 of Fig. **13**".

Appropriate correction is required.

Claim Objections

2. Claim 32 is objected to because of the following informalities: claim 32 line 1, "A method of claim 28" should be change to "A method of claim 29".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 28, 56 and 84 are rejected under 35 U.S.C. 102(e) as being anticipated by Farr (US 6,940,593).

1) With regard to claim 28, Farr disclose a device (Figure 1 and Figure 5) for deflecting electromagnetic waves comprising:

a first deflector (520 in Figure 5) deflecting electromagnetic waves within a first wavelength band and passing electromagnetic waves within a second wavelength band (column 3 line 10-25, column 7 line 9-33); and

a second deflector (515 in Figure 5) deflecting electromagnetic waves within a second wavelength band, the second deflector positioned to receive the electromagnetic waves passed through the first deflector (column 3 line 10-25, column 7 line 9-33).

2) With regard to claim 56, Farr disclose a method (Figure 1 and Figure 5) for deflecting electromagnetic waves comprising:

deflecting electromagnetic waves within a first wavelength band and passing electromagnetic waves within a second wavelength band by a first deflector (520 in Figure 5, column 3 line 10-25, column 7 line 9-33); and

deflecting electromagnetic waves within a second wavelength band by a second deflector (515 in Figure 5), the second deflector positioned to receive the electromagnetic waves passed through the first deflector (column 3 line 10-25, column 7 line 9-33).

3) With regard to claim 84, Farr disclose a device (Figure 1 and Figure 5) for deflecting electromagnetic waves comprising:

first means (520 in Figure 5) for deflecting electromagnetic waves within a first wavelength band and passing electromagnetic waves within a second wavelength band (column 3 line 10-25, column 7 line 9-33); and

second means (515 in Figure 5) for deflecting electromagnetic waves within a second wavelength band, the second means for deflecting positioned to receive the electromagnetic waves passed through the first means for deflecting (column 3 line 10-25, column 7 line 9-33).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 2, 4-6, 8, 11, 27, 29, 30, 32-34, 36, 39, 55, 57, 58, 60-62, 64, 67 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rice (US 5,347,387) in view of Farr (US 6,940,593).

1) With regard to claim 1, Rice discloses a communication device (Figure 1) comprising:

an aperture structure (14 ad 15 in Figure 1); and

deflector (20a and 18 in Figure 1) deflecting respective electromagnetic signals passing through the aperture structure.

But Rice does not teach a stack of deflectors deflecting respective electromagnetic signals of respective wavelengths at respective angles.

However, Farr, in the same field of endeavor, discloses a device (Figure 1) comprising deflectors (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25,

column 7 line 9-33) deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

2) With regard to claim 2, Rice and Farr disclose all of the subject matter as in claim 1 above, and Rice further discloses an aperture linear/circular polarization device (16 in Figure 16) between at least one of the deflectors and the aperture structure.

3) With regard to claim 4, Rice and Farr disclose all of the subject matter as in claim 1 above, but Rice does not disclose wherein the deflectors form a first stack, a deflector in the first stack passing a signal deflected by another deflector in the first stack.

However, Farr, in the same field of endeavor, discloses a deflector stack (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33), and each deflector (520 or 515 or 510 or 505 in Figure 5) in the stack passing a signal deflected by another deflector in the first stack deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point

on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

4) With regard to claim 5, Rice and Farr disclose all of the subject matter as in claims 1 and 4 above, but Rice does not disclose wherein at least one deflector in the first stack deflects substantially all signals within a wavelength band.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within a wavelength band (column 3 line 10-14, and Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

5) With regard to claim 6, Rice and Farr disclose all of the subject matter as in claims 1, 4 and 5 above, but Rice does not disclose wherein individual deflectors in the first stack deflect substantially all signals each within its respective non-overlapping wavelength band and pass signals deflected by other deflectors in the first stack.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within its respective non-overlapping wavelength band

and pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

6) With regard to claim 8, Rice and Farr disclose all of the subject matter as in claims 1 and 4-6 above, and Rice further disclose wherein the deflector is a reflector (MIRROR). But Rice does not disclose the deflectors in stack are reflectors.

However, Farr, in the same field of endeavor, discloses that the deflectors in the stack are reflectors (Figure 1 and Figure 5, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

7) With regard to claim 11, Rice and Farr disclose all of the subject matter as in claims 1 and 4 above, but Rice does not disclose wherein individual deflectors in the stack pass signals deflected by other deflectors in the stack.

However, Farr, in the same field of endeavor, discloses that individual deflectors in the stack pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

8) With regard to claim 27, Rice and Farr disclose all of the subject matter as in claim 1 above. And Rice further discloses wherein the aperture structure is a telescope (the combination of 14 and 15 in Figure 1, column 10 line 38-39).

9) With regard to claim 29, Rice discloses a method (Figure 1) for communication comprising:

passing of electromagnetic signals by an aperture structure (14 ad 15 in Figure 1); and

deflecting respective electromagnetic signals of respective wavelengths at respective angles by deflector (20a and 18 in Figure 1).

But Rice does not teach a stack of deflectors deflecting respective electromagnetic signals of respective wavelengths at respective angles.

However, Farr, in the same field of endeavor, discloses a device (Figure 1) comprising deflectors (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33) deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the method of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

10) With regard to claim 30, Rice and Farr disclose all of the subject matter as in claim 29 above, and Rice further discloses a method of comprising changing type of polarization of electromagnetic signals using an aperture linear/circular polarization device (16 in Figure 16) positioned between at least one of the deflectors and the aperture structure .

11) With regard to claim 32, Rice and Farr disclose all of the subject matter as in claim 29 above, but Rice does not wherein the deflectors form a first stack, a deflector in the first stack passing a signal deflected by another deflector in the first stack.

However, Farr, in the same field of endeavor, discloses a deflector stack (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33), and each

deflector (520 or 515 or 510 or 505 in Figure 5) in the stack passing a signal deflected by another deflector in the first stack deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the method of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

12) With regard to claim 33, Rice and Farr disclose all of the subject matter as in claims 29 and 32 above, but Rice does not disclose wherein at least one deflector in the first stack deflects substantially all signals within a wavelength band.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within a wavelength band (column 3 line 10-14, and Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the method of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

13) With regard to claim 34, Rice and Farr disclose all of the subject matter as in claims 29, 32 and 33 above, but Rice does not disclose wherein individual deflectors in the first stack deflect substantially all signals each within its respective non-overlapping wavelength band and pass signals deflected by other deflectors in the first stack.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within its respective non-overlapping wavelength band and pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

14) With regard to claim 36, Rice and Farr disclose all of the subject matter as in claims 29 and 32-34 above, and Rice further disclose wherein the deflector is reflector (MIRROR). But Rice does not disclose the deflectors in stack are reflectors.

However, Farr, in the same field of endeavor, discloses that the deflectors in the stack are reflectors (Figure 1 and Figure 5, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point

on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the method of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

15) With regard to claim 39, Rice and Farr disclose all of the subject matter as in claims 29 and 32 above, but Rice does not disclose wherein individual deflectors in the first stack pass signals deflected by other deflectors in the first stack.

However, Farr, in the same field of endeavor, discloses that individual deflectors in the stack pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the method of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

16) With regard to claim 55, Rice and Farr disclose all of the subject matter as in claim 1 above. And Rice further discloses wherein the aperture structure is a telescope (the combination of 14 and 15 in Figure 1, column 10 line 38-39).

17) With regard to claim 57, Rice discloses a communication device (Figure 1) comprising:

aperture means (14 ad 15 in Figure 1); and

means (20a and 18 in Figure 1) for deflecting respective electromagnetic signals passing through the aperture means.

But Rice does not teach a stack of deflectors deflecting respective electromagnetic signals of respective wavelengths at respective angles.

However, Farr, in the same field of endeavor, discloses a device (Figure 1) comprising deflectors (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33) deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

18) With regard to claim 58, Rice and Farr disclose all of the subject matter as in claim 57 above, and Rice further a device of comprising means for linear/circular polarization (16 in Figure 16) between at least one of means for deflecting and the aperture means.

19) With regard to claim 60, Rice and Farr disclose all of the subject matter as in claim 57 above, but Rice does not disclose wherein the means for deflecting form a first stack, each means for deflecting in the first stack passing a signal deflected by another means for deflecting in the first stack.

However, Farr, in the same field of endeavor, discloses a deflector stack (the wedge stack in Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33), and each deflector (520 or 515 or 510 or 505 in Figure 5) in the stack passing a signal deflected by another deflector in the first stack deflecting respective electromagnetic signals of respective wavelengths at respective angles.

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

20) With regard to claim 61, Rice and Farr disclose all of the subject matter as in claims 57 and 60 above, but Rice does not disclose wherein at least one means for deflecting in the first stack deflects substantially all signals within a wavelength band.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within a wavelength band (column 3 line 10-14, and Figure 1 and Figure 5, column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr

to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

21) With regard to claim 62, Rice and Farr disclose all of the subject matter as in claims 57, 60 and 61 above, but Rice does not disclose wherein individual means for deflecting in the first stack deflect substantially all signals each within its respective non-overlapping wavelength band and pass signals deflected by other means for deflecting in the first stack.

However, Farr, in the same field of endeavor, discloses the deflector in the stack deflects substantially all signals within its respective non-overlapping wavelength band and pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

22) With regard to claim 64, Rice and Farr disclose all of the subject matter as in claims 57 and 60-62 above, and Rice further wherein the means for deflecting is means for reflecting (MIRROR). But Rice does not disclose the deflectors in stack are reflectors.

However, Farr, in the same field of endeavor, discloses that the deflectors in the stack are reflectors (Figure 1 and Figure 5, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

23) With regard to claim 67, Rice and Farr disclose all of the subject matter as in claims 57 and 60 above, but Rice does not disclose wherein individual means for deflecting in the first stack pass signals deflected by other means for deflecting in the first stack.

However, Farr, in the same field of endeavor, discloses that individual deflectors in the stack pass signals deflected by other deflectors in the stack (ABSTRACT, column 3 line 10-14, and column 4 line 7-25, column 7 line 9-33).

Farr's configuration allows the optical reflection device to very precisely reflect individual wavelengths that are passing through the aperture etc towards specific point on a corresponding detector. Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the deflectors taught by Farr to the device of Rice so that a multi-wavelength system can be implemented and system capacity can be substantially increased.

24) With regard to claim 83, Rice and Farr disclose all of the subject matter as in claim 57 above. And Rice further discloses wherein the aperture means is a telescope (the combination of 14 and 15 in Figure 1, column 10 line 38-39).

7. Claims 3, 7, 26, 31, 35, 54, 59, 63 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rice (US 5,347,387) and Farr (US 6,940,593) as applied above in claims 1 and 4-6, and further in view of Sakanaka (US 6,335,811).

1) With regard to claim 3, Rice and Farr disclose all of the subject matter as in claims 1 above, but Rice and Farr do not disclose wherein at least one of the deflectors is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

2) With regard to claim 7, Rice and Farr disclose all of the subject matter as in claims 1 and 4-6 above, and the device of Farr can reflect signals at nearly normal incidence (Figure 5), but Rice and Farr do not disclose wherein at least one of the deflectors in the first stack is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

3) With regard to claim 26, Rice and Farr disclose all of the subject matter as in claim 1 above, but Rice and Farr do not disclose wherein electromagnetic signals deflected by at least one of the deflectors carry communications transmitted by the device and communications received by the device.

Sakanaka, in the same field of endeavor, discloses a deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52) deflects electromagnetic signals carrying communications transmitted by the device and communications received by the device.

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can deflect both transmitting signal and receipting signal, and the implement cost can be reduced.

4) With regard to claim 31, Rice and Farr disclose all of the subject matter as in claims 29 above, but Rice and Farr do not disclose wherein at least one of the deflectors is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

5) With regard to claim 35, Rice and Farr disclose all of the subject matter as in claims 29 and 32-34 above, and the device of Farr can reflect signals at nearly normal incidence (Figure 5), but Rice and Farr do not disclose wherein at least one of the deflectors in the first stack is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

6) With regard to claim 54, Rice and Farr disclose all of the subject matter as in claim 29 above, but Rice and Farr do not disclose wherein electromagnetic signals deflected by at least one of the deflectors carry communications transmitted by the device and communications received by the device.

Sakanaka, in the same field of endeavor, discloses a deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52) deflects

electromagnetic signals carrying communications transmitted by the device and communications received by the device.

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can deflect both transmitting signal and receipting signal, and the implement cost can be reduced.

7) With regard to claim 59, Rice and Farr disclose all of the subject matter as in claims 57 above, but Rice and Farr do not disclose wherein at least one of the means for deflecting is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

8) With regard to claim 63, Rice and Farr disclose all of the subject matter as in claims 57 and 60-62 above, and the device of Farr can reflect signals at nearly normal incidence (Figure 5), but Rice and Farr do not disclose wherein at least one of the means for deflecting in the first stack is movable.

Sakanaka, in the same field of endeavor, discloses a movable deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52).

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the movable deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can align the input signals more accurately and reduce the signal loss, and also can reflect signals of different angle of incident to a common path.

9) With regard to claim 82, Rice and Farr disclose all of the subject matter as in claim 57 above, but Rice and Farr do not disclose wherein electromagnetic signals deflected by at least one of the means for deflecting carry communications transmitted by the device and communications received by the device.

Sakanaka, in the same field of endeavor, discloses a deflector (the mirror 31 in Figure 2 can be interpreted as the deflector, column 3, line 44-52) deflects electromagnetic signals carrying communications transmitted by the device and communications received by the device.

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the deflector taught by Sakanaka in the device of Rice and Farr so that the deflector can deflect both transmitting signal and receipting signal, and the implement cost can be reduced, and also can reflect signals of different angle of incident to a common path.

Allowable Subject Matter

8. Claims 9, 10, 12-25, 37, 38, 40-53, 65, 66, 68-81 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: the present invention comprises a free space communication device for increasing traffic throughput and widening the utility of optical terminals. And the wavelength division and polarization division multiple access free space optical terminal is disclosed; using the two stack of deflectors which are movable, electromagnetic signals of respective wavelengths at respective angles can be directed to a common path. The closest prior art Rice (US 5,347,387) and Sakanaka (US 6,335,811) shows a similar system and a single aperture. However, the prior art fail to disclose the wavelength division and the two stack of movable deflectors which can reflect signals at nearly normal incidence.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Rockwell (US 6,327,063) discloses a reconfigurable laser communications terminal.

Orino et al (US 5,627,669) disclose optical transmitter-receiver and a wavelength selective filter is used.

Sakanaka (US 7,058,307) discloses a free-space optical communication apparatus and system which can communicate with a plurality of other apparatus by driving a mirror to an angle corresponding to the stored angle-setting information.

Bloom et al (US 5,710,652) discloses a laser communication transceiver and system.

Arnold et al (US 6,347,001) disclose a free-space laser communication system having six axes of movement.

Kato et al (US 6,618,177) discloses a light space-transmission device.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 7:30 am - 5:00 pm, alternating Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Li Liu
July 18, 2006

Shuwang Liu

SHUWANG LIU
SUPERVISORY PATENT EXAMINER